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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,298	02/06/2004	William Allen Rogers JR.	VEL03-GN003	5458
30074 7590 01/30/2008 TAFT, STETTINIUS & HOLLISTER LLP SUITE 1800 425 WALNUT STREET CINCINNATI, OH 45202-3957			EXAMINER MERKLING, MATTHEW J	
			ART UNIT 1795	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/774,298

Applicant(s)

ROGERS ET AL.

Examiner

Matthew J. Merkling

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 and 48-90 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 and 48-90 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/ are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicants argument that the amended claims (48-90) which now depend from previously presented independent claims 1 and 17 are not patentably distinct from each other because of their dependence from elected claims 1 and 17 is persuasive. The examiner agrees that claims 48-90 do not constitute an invention that is independent and distinct from elected claims 1 and 17. As such, claims 48-90 will be examined on the merits.

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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3. Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 11/052455. Although the conflicting claims are not identical, they are not patentably distinct from each other because Both claims are claiming a structure comprising microchannels, contained in a pressure vessel.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Moreno et al. (US 2004/0081600).

Regarding claims 1 and 17, Moreno discloses a chemical process system comprising:

a first unit operation (microreactor, see Fig. 1) comprising microchannels (microreactor, see abstract) adapted to be in fluid communication with an inlet stream (30 or 24) and an outlet stream (32) for carrying out a continuous process;

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a pressure vessel (12) at least partially containing the first unit operation therein (see Fig. 1), the pressure vessel concurrently adapted to be occupied by a medium to compress the microchannels of the first unit operation (see paragraph 24); and

a purge stream (such as, for example, 34, Fig. 3) adapted to be in fluid communication with an inert medium source (inert gas) for selectively conveying the inert medium from the inert medium source and into fluid communication with the first unit operation (see Fig. 3 and paragraph 36);

where at least a portion of the microchannels are isolated from an interior of the pressure vessel (inlet lines are partially isolated from the interior of the microreactor, see paragraph 34).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. Claims 1-12, 16-31, 33, 67-70, 74-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonjo et al. (US 6,159,434) in view of Reiser (GB 2128013).

Regarding claims 1-6, 10-12, 16-31, 33, 67, 74-76 and 78-87, Gonjo discloses a chemical process system comprising:

a first unit operation (reformer, 4, see Fig. 1A) comprising microchannels (compact plate style reformer with channels, see col. 28 lines 32-38 and see channels in Figs 6 and 7, for example) adapted to be in fluid communication with an inlet stream (liquid feed, see Fig. 1A) and an outlet stream (Reformed Gas, see Fig. 1A) for carrying out a continuous process;

a second unit operation (catalytic combustor, 6a and 6b, see Fig. 1A) in thermal communication with the first unit operation (see Fig. 1A, where catalytic combustion portions 6a and 6b are in thermal communication with reforming portion 4);

wherein the first and second unit operations are coupled to each other (see flow diagram of Fig. 1A where reforming portion and catalytic combustion portion are fluidly connected); and

wherein the first and second unit operations also include a heat exchanger upstream and downstream from said unit operations (see flow diagram in Fig. 1A where inlet and outlet streams of the first and second unit operations are in contact with a heat exchanger).

While Gonjo teaches a plate style chemical process system that is designed to be compressed together in order to prevent leaking reactants and products (see col. 14 lines 27-35), Gonjo fails to disclose the chemical process system contained in a pressure vessel and also fails to disclose the associated pressure control devices incorporated by said pressure vessel.

Reiser also discloses a chemical process system that comprises a plate style apparatus (fuel cell stack, 10, see Fig.1, page 1 lines 105-110) that addresses the same problem of leaking from a plate style chemical process system (see page 1 lines 53-59).

Reiser teaches:

a pressure vessel (14) at least partially containing a operation therein (10, see Fig. 1), the pressure vessel concurrently adapted to be occupied by a medium (such as inert gas, supplied ) to compress the unit operation in order to prevent any leaking of reactants or products from the unit operation by maintaining a pressure inside the pressure vessel higher than the pressure in the unit operation (page 1 lines 45-52);

a stream adapted to be in fluid communication with an inert medium source (same as inert gas mentioned above) for conveying the inert medium from the inert medium source and into fluid communication with the first unit operation (page 1 lines 45-52); and

a recycle stream for cycling the compressive medium into and out of the pressure vessel (see flow diagram of Fig. 1)

Reiser teaches this pressure vessel as an effective means for preventing the leaking of valuable reactants and products from a unit operation that is comprised of a plate style apparatus (page 1 lines 45-59).

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the pressure vessel and associated structure of Reiser, to the chemical process system of Gonjo in order to further prevent valuable reactants and products from leaking out of a unit operation.

Regarding limitations recited in claims 1, 7-9, 17, 22, 31, 68-70, 77-79 and 88-90 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.

9. Claims 13-15, 32, 48-66 and 71-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonjo et al. (US 6,159,434) and Reiser (GB 2128013) as applied to claims 1, 17 and 25 above, and further in view of Toole et al. (US 4,167,915).

Regarding claims 13-15, 32, 48-57, 59-62, 66 and 71-73 Gonjo, as modified by Reiser and discussed in claims 1, 17 and 25, teaches



a first unit operation (reformer, 4, see Fig. 1A) comprising microchannels (compact plate style reformer with channels, see col. 28 lines 32-38 and see channels in Figs 6 and 7, for example) adapted to be in fluid communication with an inlet stream (liquid feed, see Fig. 1A) and an outlet stream (Reformed Gas, see Fig. 1A) for carrying out a continuous process;

a second unit operation (catalytic combustor, 6a and 6b, see Fig. 1A) in thermal communication with the first unit operation (see Fig. 1A, where catalytic combustion portions 6a and 6b are in thermal communication with reforming portion 4);

wherein the first and second unit operations are coupled to each other (see flow diagram of Fig. 1A where reforming portion and catalytic combustion portion are fluidly connected);

wherein the first and second unit operations also include a heat exchanger upstream and downstream from said unit operations (see flow diagram in Fig. 1A where inlet and outlet streams of the first and second unit operations are in contact with a heat exchanger);

a pressure vessel (14) at least partially containing a operation therein (10, see Fig. 1), the pressure vessel concurrently adapted to be occupied by a medium (such as inert gas, supplied ) to compress the unit operation in order to prevent any leaking of reactants or products from the unit operation by maintaining a pressure inside the pressure vessel higher than the pressure in the unit operation (page 1 lines 45-52);

a stream adapted to be in fluid communication with an inert medium source (same as inert gas mentioned above) for conveying the inert medium from the inert medium source and into fluid communication with the first unit operation (page 1 lines 45-52); and

a recycle stream for cycling the compressive medium into and out of the pressure vessel (see flow diagram of Fig. 1).

In other words, modified Gonjo teaches a pressure vessel that maintains and controls a pressure differential between the pressure vessel and the unit operations, as discussed above, but fails to disclose the specific control mechanism that is used to maintain the pressures in the pressure vessel and the unit operation.

Toole also discloses a system that maintains and regulates pressures between a pressure vessel (shell, 5) that comprises an inert gas and a unit operation (wafer oxidation, 11).

Toole teaches a controller operatively coupled to a first sensor monitoring an internal pressure within the pressure vessel and a second sensor monitoring an internal pressure within the first unit operation (see outlet lines 22 and 23 from the pressure vessel and unit operation, respectively, which connect to back pressure regulators 61 and 64, which sense the pressure differential in the two spaces and adjust the outlet flows to reach the desired differential, see col. 4 lines 26-45). Furthermore, Toole discloses a vent (66) in fluid communication with the pressure vessel to selectively vent the inert medium (col. 4 lines 26-45). Toole teaches this configuration as a preferable means for simultaneously maintaining pressure

control inside a pressure vessel as well as a unit operation inside said pressure vessel (col. 3 lines 3-17).

As such, it would have been obvious to one of ordinary skill to add the pressure control means of Toole, to modified Gonjo, in order to preferably control the pressure inside the pressure vessel at a higher pressure than that of the unit operations (as mentioned above).

Regarding claim 64, Gonjo, as modified by Reiser discloses a cylindrical pressure vessel (see Reiser, Fig. 1), and a rectangular first unit operation module (see Fig. 4).

Regarding claim 65, Gonjo further discloses at least one of the first and second unit operations is in fluid communication with an open atmosphere (see air inlet, in Fig. 1A).

Regarding limitations recited in claims 58 and 63 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

#### **Response to Arguments**

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10. Applicant's arguments with respect to claims 1-33 have been considered but are moot in view of the new ground(s) of rejection that are necessitated by amendment and newly examined claims 48-90.

### **Conclusion**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Merkling whose telephone number is (571) 272-9813. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MJM



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